TO TRAVEL UNDER WATER.

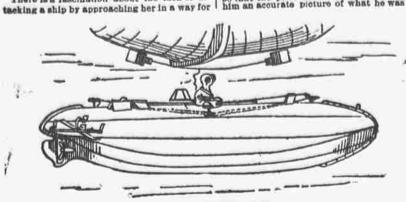
WHAT IS THE MATTER WITH THE SUB-MARINE TORPEDO BOAT!

It Is a Terribly Effective Craft in Theory. but Well Nigh a Failure in Practice— Difficulties to be Overcome—Some of the Boats That Slave Now Been Built. A reader of THE SUN, who observed that Secretary of the Navy Tracy did not say anything in his report about the possibility of using submarine torpedo boats as a means of destroying an enemy's war ships, writes to ask

THE SUN to tell what has been accomplished by inventors who have made a study of this peculiar sort of vessel. There is a fascination about the idea of at-

the dynamite gun were contemposed. But none were tried.

Another novel feature of this boat was the use of a mirror for ascertaining the evemy's position. Through the top of the turret was erected a metal tube eight feet high. In the top of this was an inclined mirror, which reflected the scene forward of the boat down through the tube and a camera holds prism so that the pilot could see on a plane before him an accurate picture of what he was trav-



THE TUCK TORPEDO BOAT.

which her crew must be wholly unprepared. and with a power against which they are inca-pable of defending themselves. The great war ship, perhaps a huge ironelad, with guns that will throw a 1,800-pound projectile twelve miles, is lying at anchor off a port that she is about to bombard; or she may be steaming about with her crew at quarters and every one alert. The air may be clear and a breeze may be blowing to carry away the smoke from her guns. Any approach of a torpedo boat on the surface would be welcomed by a deadly hall from the rapid-fire guns. The advent of another fronciad would be met with the destructive fire of the great guns. It is apparent that this ship is equal to anything known to ordinary naval warfare. And yet, while her crew is feeling most secure and are already counting their shares of the prospecenemy unheralded, undiscoverable, and irresistible. A tiny craft, so small that she could lie athwartships on the deck of the great war ship, has bored its way through the water until it is within half a cable's length of the ironclad. Its pilot is gazing through a tiny bull'seye at the shadowy hulk before and above him. Holding the tiller rope with one hand he gropes with the other for a lever, which he pulls with a jerk. A torpedo files from the tiny craft and strikes the bottom of the monster above. There is a sudden and terrible shock of its explosion. The bottom of the great ship is torn open, she fills instantly, and the waves

part only to close over her as she sinks out of sight with all on board. Thereupon the submarine boat, if she have escaped the awful effect of her own destrucescaped the awful enect of her own destruc-tive powers, comes to the surface, and the crew come out on deck, gaze with satisfaction on the human flotsam and jetsam, wave their hate in exultation, and steam ashore for laurel wreaths of assorted sizes.

200 pounds of dynamite have been hurled through the air with accuracy for one mile. With a submarine beat to carry this gun, the projectile might be fired either through the air or the water as circumstances warranted.

In the experiments made at Fort Hamilton the boat attained a speed of nine miles on the surface, and was frequently sunk and raised to the surface of the water with her crew on board. Considering that the motor was an old one built for another purpose, and not well adapted to this purpose, the speed was very encouraging.

It should be said that other methods of getting the torpedo against the enemy's ship than the dynamite gun were contemplated, but none were tried.

Another novel feature of this beat was the

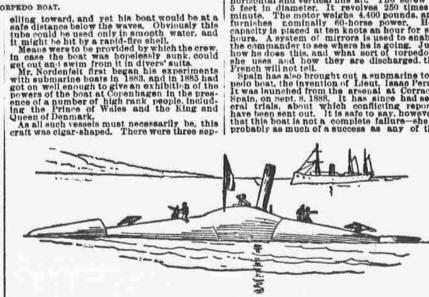
fins, as the others have, for submerging her when she is in motion. These fins may be operated by a pendulum to keep an aven keel. A novel feature of the boat is a heavy weight carried underneath, which may at any time be released so that the craft will rise to the surface at once. To aid in submerging the vessel she has also two water tanks. Like Nordenfeit's boats, the tanks are emptied by pumps. Having electricity for a motive power, the interior is lighted by electricity. Of course, when in actual use the pilot's syes would have to be shaded from laterior light, or he could see nothing without, even when near the surface. It would be possible to fix a search light on top of her to help in finding the built of the enemy, but the trouble with this would be that it would reveal the boat to the enemy.

Mr. Waedington carried three torpedoes, two of the controllable sort, propelled and eventually fired by electricity. The third has a sort of a floating magazine, which on being released would rise up as the boat passed under a ship at anchor, and would then be fired when the boat to at Livernool, and a great many special tors were favorably impressed by the results.

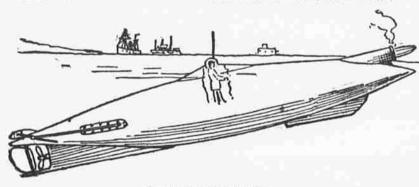
Not unlike this vessel is the Gymnotus, owned by the French Government. Her original designs were by Dupuy on Lorne's task was passed on to Naval Constructor Zede, who adopted an electric motor invented by Capt. Krebs for use in a balloon.

The first trials were had in 1876 with Reynle's accumulators. They failed. A light alkaline liquid accumulator was tried, and with success. Her first public trial was had on Sept. 20, 1887, and the French papers afterward announced that their Government slone had a practical submarine torpedo boat. Later trials held at Toulon in September. 1888, confirmed the previous good opinions of her.

Not very much is known of her. for she is a State eere. She is 65% feet long, and of 6 feet diameter amidships, her model being that of a substantial sewing needle. On top is a narrow platform, with an 18-inch manhole in it, be



NOBDENFELT'S LATEST.



THE HOLLAND-ZOLINSET TOPA

It need only be said that were every port defended by a submarine boat that could with certainty explode a torpedo against the bottom of an enemy's ship whenever that ship came within range of the port, no attempts to blockade or bombard a harbor would ever be made, and naval conflicts would be confined to duels on the high seas between armorelaids and the destruction of peaceful merchantmen. This statement needs no proof. To provide such a submarine boat has been the dream of no one knows how many inveniors; certainly, the subject has been almost constantly under consideration ever since the days of David Bushnell in 1776, but because of the difficulties in the way, no one has yet arrived nearmough to perfection to warrant any Government in building anything more than an experimental craft.

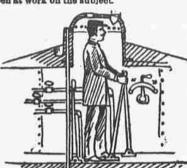
And yet, inventors whose names are known the world over—notably Nordenfelt, the machine-gun man, and Zalinski, the developer of the dynamite-throwing gun, have for years been at work on the subject.

This boat was 61 feet long and 9 in diameter. She was bullt of steel. She had a surface speed of 8 knots and ran 150 miles on one coaling. Her motive power was in a steam boiler. The water in this was heated until a pressure of 150 pounds to the inch was obtained. Then the furnace was sealed, and on the power thus in reserve, applied to a four-bladed screw, drove her 16 miles at 3 knots an hour under water.

On novel device was a pendulum which so controlled the horizontal propellers and fins that any tendency to roll or pitch from a level keel was prevented. Another device so controlled be horizontal propellers that on reserve applied to a four-bladed screw, drove her 16 miles at 3 knots an hour under water.

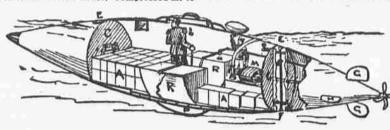
On novel device was a pendulum which so controlled the horizontal propellers and fins that any tendency to roll or pitch from a level keel was prevented. Another device so controlled be made.

In 1887 Mr. Nordenfelt had so far improved his bout that three of them, after prolonged tests, were purchased by the Turkish Gove



The first man in recent years to make any gir in this port with a submarine boat was Mr. John Holland. It was with him that Lieut. Zalinski has labored. Holland was an enthusiast on the subject. He began building a boat about the time of the great outbreak of Fenian wind, and was accused of making the boat for the destruction of British comperce. Holland enied this. Whoever his first backers may have been Holland broke with them because he believed they were trying to rob him of his share of expected profits, and the boat was never completed. When the people who were furnishing the money to develop the dynamite gun were approached by Holland they agreed to make an investment in the project. The idea of using a submarine boat fitted in well with the idea of a dynamita gun that used compressed air to fire its projectile. Besides these same capitalists owned an engine operated by petroleum gas instead of steam, and had fitted it to a small yacht which they called the Wonder. This motor discharged the products of the explosion in the engine cylinder through pipes opening into the sea instead of the open air. It was natural te suppose that such a motor would easily be adapted to propelling a submarine boat, and so, indeed, it would be. BECTION OF HOLLAND-EALINSEI CONNING TOWER

rate steam engines. One worked the server propeller, and the other two worked the server propeller and the other two worked earlier propellers of the state of the state



AN ELECTRIC TORPEDO BOAT.

A.—Storage batteries. C.—Bulkheada E.—Vertical tobes, with horizontal propellera. G.—Ruddera.

H. Horizontal fin. M.—Electric motor. R.—Water tanks. P.—Weight to be drepped in an emergency.

aupply that viliated was carried in tanks. They had a coal capacity sufficient to steam 900 miles on the surface. They carried two fish torpedoes on the bow and, curiously enough two quick-firing guns outside on deck.

The vertical acting screws instead of being placed in side sponsons, were placed on top, in addition to the ordinary marine boilers they were seach provided with hot-water tanks holding 30 tons of water. This water was beated up until a pressure of 150 pounds to the inch was obtained by means of a steam call from the boller. These tanks gave a resorve power for feeding the bollers when the fires were in the first ones.

Mr. Nordenfelt demonstrated that he could sink the boat to any required depth and then go backward or forward wholly unseen from the surface, keeping, meantime, on a level keel, and at the right moment discharge his torpedoes at a target—in short, that he had an excellent control of the boat. According to the surface, keeping meantime, on a level keel, and at the right moment discharge his torpedoes at a target—in short, that he had an excellent control of the boat, According to most engineers this is the best submarine boat so far produced.

The real real submarine boat to be considered is, however, of most excellent design, it is, moreover, propelled by electricity, it is from every propelled by electricity. It is from every propelled by electricity.

however, of most excellent design. It is, more-over, propelled by electricity. It is from de-

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Accordingly a wooden hull of aspindle shape, 50 feet long and 8 feet in diameter, was constructed and provided with a motor. On deck (if such a hull may be said to have a deck), amidships, was a small turret having glass bull's-eyes for the pilot to look through. There were chambers in the bottom of the boat to which water could be admitted to sink her until her turret was just awach. Then the horizontal fins at the stern were to be tilted so as to elevate the stern and depress the how and so force her under water; or she could be wholl's sink by admitting more water.

The water compartments were placed at the bow and the stern; they were connected with the shear holding compressed air. In case it was desired to expel the water a valve let the air in and the water went out.

The experiments have not yet proceeded far enough to provide her with a weapon of offence. The plans are to put one of Zalinski's dynamite suns in the bow. With the charge of air at a pressure of 1,000 pounds to the square linch.

NORDENFELT'S FIRST BOAT.

to a sneed of four knots under water. She got alongside the Housatonic and fired her torpedo. It proved terribly effective, for it carried down the war ship, which in turn carried down the war ship, which in turn carried down the war was opened. A contemplation of the feellog of those men as they lay there imprisoned at the bottom has by no means discouraged other attempts of a like nature. In fart, there have been a good many such pitiful deaths is the course of the trials of these submarine boats. The Rev. Mr. Garrett, among the rest, with his boat was lost on the coast of Wales. There have been many thrilling escapes as well, but these have commonly been concealed by those involved, lest the stories isseen the prospect of the boats being sold.

There are a number of reasons which account for the slowness of naval officers in allopting or recommending submarine boats. The yrelate chiefly to the difficulties in the way of accomplishing anything with such losts.

To begin with, war ships can now travel at a speed of nine or ten knots andour when crusing off an enemy's coast or port. No submarine boat has been made that could certainly do this in spite of the French assertion that their boat is a ten-knot crait. Even supposing she coal make ten knots, she could not, save by accident, get under a ton-knot warship. Once under it she would risk coiliding with the bottom, and so getting rolled over or crushed in and destroyed. She might get a touch from the big screw, and thus get sunk.

Were than this is the utter darkness in which a boat travels when under water. The submarine boat is crew must calcuste the location of a moving enemy, the distance their own boat will travel in a given time, the distance their own boat will travel in a siven time, the distance she will travel in a siven time, the distance she will travel in a siven time, the distance she will travel in a siven time, the distance she will travel in a siven time, the distance she will travel in a siven time, the distance she will travel in a siven th

the rapid-fire guns—say four inches thick over the exposed oval.

The hardest thing in the world for naval constructors to do is to get away from traditions. They have been putting masts and salis on ships for twenty years now, since twin screws were adopted and rendered sails an obstruction. They are now building torpede boats that stand up out of water like a three-story tenement, and then they try to make those boats impenetrable to shot by laying a two-inch iron deck on ton. The conservative British constructor makes the model, and all the world—and especially the Yankee constructor, who once boasted his ability to lead—must loilow, because the British assert that their navy is as strong as any two in the world.

To build a torpede boat on the model of a Liverpool liner—and that is the model of about every such craft in the world—is ridiculous. A bill to provide for five such useless hulks has been introduced in the House at Washington.

The sole object in making a submarine torpedo boat is to enable its crew to launch a torpedo boat is to enable its crew to launch a torpedo against an enemy with certainty and satety to the submarine crew. A torpedo boat that could maintain a speed of twenty knots, and had an armored oval deck four inches thick, just awash, could, with absolute certainty and safety, launch a tornedo against an enemy's side. To build a submarine boat is impracticable; to build a boat that is armored and almost submerged is a very simple problem.

LOOK OUT! WE'SE G'HINE SHOOT! If You Foreigners Don't Hold Up when the

When the steamship Barraconta, from the West Indies, boldly entered our harbor a few weeks ago without heeding the shricking commands of the revenue cutter Chandler for her to slow up, the incident had its amusing side, Collector Erhardt was on board of the cutter at the time, and it wasn't very difficult to imagine the big steamship running along like a greyhound with the little cutter puffing and wheezing far astern. like a prize pug, with the dignified Collector standing, without sea legs, on the pitching deck and thinking bad thoughts. But the precedent set by the Barraconta is bearing fruit, and when the steamship Alarich, from Galveston, came into the harbor yesterday without paying the slightest attention to the Chandler, something had to be done

about it. Lieut, Smith of the Chandler sent

tion to the Chandler, something had to be done about it. Lieut, Smith of the Chandler sent this letter to Collector Erhardt:

I would respectfully state that at about 8:35 c'clock this morning, off Robbin's Reef Lisbt, an attempt was made to board the German steamsing Alarich. Beggers, master from Galveston in ballest, consigned to Funch. The flag and pennant of the revenue cutter Chandler were prominently displayed, and in addition thereto their team whistle was used vigorously to attract the attention of those in authority. The displayed attract the attention of those in authority. The displayed attract the attention of those in authority. The displayed attract the attention of those in authority. The displayed attract the attention was paid to the demonstrations of the revenue cutter, the speed was not alackened, and the stamship continued in her course, athough the errand of the Chandler must have been patent to the pilot if not to the master of the German ve-soi.

Inasmuch as the steamstip Lash, containing 607 passengers was but a short disclane safern, together with Chandler was made to enforce recognition. It would have carried the revenue cutter some distance up the harbor and interfered generally with the public business. There is a growing disposition on the part of those controlling foreign vessels visiting United States waters to disregard the regulations governing the same.

Section 2,703, R. S., provides that when any vessel reinsing to bring to, on being chased by a revenue cutter which has displayed the pennant and ensign prescribed for vessels in the revenue service, the "apian of such cutter may fire at or into such vessel which does not bring to after such pennant and ensign prescribed for vessels in the revenue service, the "apian of such cutter may fire at or into such vessel which does not bring to after such pennant and ensign has been highed and a gun has been fired by such alteral enforcement of the above law would have a beneficial and assumpt yeffect upon foreign vessels their masters

of time,
A greater respect for the country would follow, your
own authority would be strengthened, and my duties be
relieved of an annoyance that is both trying and hard to
bear. Your attention is respectfully called to Sections
3.477 and 1.693. R. S., and I respectfully request that the
law be enforced in accordance with the provisions of
the same. Very respectfully.
H. D. Sarris, First Lieutenant, Commanding.

H. D. Swirs, First Lloutenant, Commanding.
The matter will be laid before the Secretary
of the Treasury, and some of these days when
a big steamship is jauntily skipping up the bay
after the manuer of the Barraconta and the
Alarich perhaps a round shot will hit ber in the
stern wheel and bring her up with a suddenness that will be a fearful caution to all foreigners in the future.

MILK BY PIPE LINE.

Skilled Opinion Seems to Be That There is Nothing in It. Civilization runs to pipes. We have electricity, steam, gas, water, and petroleum

already supplied through pipes. The latest pipe scheme, started in Middletown, Orange county, proposes to send milk to New York through a pipe line similar to the oil pipe line of the Standard and other companies. The projectors talk of raising a capital of \$600,000. and of collecting all the milk within a hundred miles of New York, so as to keep up a perpetual stream of fresh milk delivered in the city. avoiding the delays of railroad transportation and cheapening the cost.

Looking about among the milk authorities of the city for information as to the prac-

ticability of this scheme, a SUN reporter found nothing but incredulity. One objection urged was that it would be absolutely impossible to send milk tumbling through pipes for such a distance without churning it pretty thoroughly, so that if it could come through the pipes at all it would appear upon delivery in the shape of lumps of butter and buttermilk. The projectors talk of sending the milk in a half-frozen condition. This is pronounced absurd for condition. This is pronounced absurd for various reasons. One is the mechanism necessary to cool milk in such a way; another is the impossibility of sending milk through the pipes in such a cendition; and another objection is that such a cooling, even if practicable, would change the character of the milk.

The most fatal objection urged by experts to such a scheme is the impossibility of keeping such a pipe clean. Any one who has inspected a dairy knows how essential it is that all the milk cans and pans shall be thoroughly cleaned with scalding hot water every day. Even partial cleaning will not answer. All traces of the stale milk must be scrupulously removed. Such a cleaning of a 100-mile pipe would be impossible. It would require a river of scalding water, replenished along the line.

Another fatal objection urged is the impossibility of inspection according to law with such a scheme. There would be no practicable way of preventing the dumping of rivers of impure milk into such a pipe.

Altogether, the opinions of the best experts coincide that, while it is possible that men might be willing to sell stock in such an enterprise, it would be surprising if anybody could be found foolish enough to buy such stock. The probability is that the talk about getting up such a opmpany is a humbug. various reasons. One is the mechanism neces-

THINKS E. B. GOWEN WAS MURDERED. Henry G. Gowen Says His Brother's Life Had Often Been Threatened.

In explanation of his letter to the Philadelphia Times regarding the death of his brother. reprinted in yesterday's SUN, Henry G. Gowen said yesterday that he and the rest of the family believed Franklin B. Gowen to have been murdered. He had many enemies, Mr. Gowen said, not only among the Molly Magueres whom he had brought to justice, but among financiers whose paths he had crossed. For many years he had received anonymous letters threatening his life. Instead of being alarmed by them he kept them in a scrap book for the amusement of those of his friends who saw humor in bad spelling and worse chirography. The same fearless disposition, indicated by his The same fearless disposition, indicated by his regarding threats unon his life as funny, made him leave the doors of his room unlocked at night, even when in a hotel. He was consequently open to attack at a time when the attacking person could most easily escape.

Having said thus much in tayor of the theory of murder, Mr. Gowen told why he did not believe his brother had killed himself. He could not have committed sucied in his right mind. Mr. Gowen said, for he had everything to live for, and that he was not incape was shown by the brilliant argument he made on the Thursday previous to his death. Mr. Gowen is not satisfied with the identification by the vender of his brother as the purchaser of the revolver found in the room at the hotel, as he says it was based on a newspaper cut which was not a good likeness. Even if he had been the purchaser, Mr. Gowen thinks his brother would not have been so unconcerned and cheerful after the purchase had he bought the weapon to kill himself with. There were no powder marks indicating the close proximity of the revolver where the far at buller entered. Mr. Gowen furthermore insisted. Mr. Gowen said, finally, that his brother would have left some explanation behind him, and would not have taken steps to reduce the incurance on his life. While declaring it to be his opinion that his brother was murdered, Mr. Gowen was careful to say that he accused an one.

An inquiry into the circumstances of Franklin B. Gowen's death is now being conducted by the Pinkerton agency. Capt Lindon of the Philadelphia bureau has charge of it, and he is trying to get at the facts, without regard to either the murder or suicide theory. regarding threats upon his life as funny, made

Singular Accident.

LEXINGTON, Ky., Dec. 21 .- One day this week Taylor Hedges, who lives near Clays-ville, in Harrison county, was tying a shock of fodder with a grapevine, when the vine snapped in twain and the piece he held in his hand penetrated his eye, completely destroying the grean. His shysician joars Hedges will disNew Zublications.

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JUHN BEACHAM, 7 Barciay st., New York.

ONE HUNDRED MILES OF WIRE DOWN. About An Eighth of the Total Mileage of

the Electric Light Companies. Work on the electric light poles and wires continued vesterday in spite of the half holiday until 4 o'clock P. M. Six gangs were out, and although one of them did nothing but out down poles, the record of wire cutting was the greatest made since the work began. A little more than 94,000 feet of wire was removed—about 18 miles. Since the crusade began about 500,000 feet, or nearly 100 miles, of wire and 828 poles have been taken down. This takes no account of wire removed privately by the companies. For the last few days the companies have been going ahead of the city's gangs, taking down such wire and fixtures as were sure to be condemned, so that the actual amount of destruction is far in excess of what is specifically reported to the Board of Electrical Control. No. work will be done to-day. On Monday six, and possibly saven, gangs will go out to continue the removal of condemned electric property. The position of the electric light companies

with reference to the felling of the wires is one of forced resignation. When the city gets through they, or at least some of them, may through they, or at least some of them, may have something to say. An attorney for one of the companies said yesterday that he thought every one of the companies whose wires had been interfered with would sue the city for damages. Commissioner Gilroy, he said, had exceeded his authority. Under cover of his directions to abate the nuisance of dangerous wires, he had removed miles upon miles of perfectly safe wires, causing the companies losses which would foot up into the hundred thousands. An attorney for another company said he was in doubt about the com-

company said he was in doubt about the com-panies being able to recover.

Fresident A. C. Bernheim of the Manhattan Company, whose station is at Eightieth atreet and East River, said that the company had practically given up all of its overhead busi-ness except that which connects with the sub-ways. It now does no lighting whatever with overhead wires, having given up its business on the Bowery, Grand street, lower Broadway, and Second and Eighth avenues.

How the Worm Turned.

Any one who knew Chevenne when it was the terminus of the Union Pacific Railroad will admit that it was a hard town. There was more cutting and shooting there in a given time than any other Western town could ever boast of, and no doubt most of the blood letting was a good thing for the community.

In the paimy days of the town I had a busi-

ness there, and next to me was a Jew clothier. He came on fresh from New York, knowing nothing of Western ways, and he hadn't got his goods in before he was half scared to death. But for the fact that the boys would have bursted in his shanty, he would have kept the door locked half the time. The toughs soon caught on to the fact that he was a coward. and one after another went in and buildozed him and had great fun at his expense. I privately advised him to get a gun and wing some of them, but he raised his hands in holy horror and exclaimed:

Great heafens! but I nefer handle nothings but clothing! I gif ten tousand dollar to be oudt of dis!"

His cowardice was pitiful to behold, but a climax was coming. One afternoon a tough called Apache Joe entered the store, having three more tough with him, and began the usual routine. The Jew begged and entrested, and actually cried, and in his disgust at such conduct. Apache Joe kicked him. That kick acted like magic. The Jew sprang forward, grabbed the revolver which Joe had temporarily deposited on the counter, and I heard six shots fired as fast as I could count. Running in, I found Apache Joe and one of his chums kicking their last, while the other two were badly wounded. It took three cf us to hold the Jew from further violenca. The worm had turned and become a tiger. After he was acquitted by the Coroner's jury, of which I was one, he bought a brace of revolvers, began to practice shooting, and in two weeks was known for fifty miles around as "The Dangerous Jew." The most exaggerated stories of his prowess were affoat, and inside of a month he had to build or, hire two clerks, and get a new stock. It was the making of him socially, financially, and all other ways, and I know that his action assisted very materially to help the law abiders get the upper hand and drive the lawless gangs further on. His cowardice was pitiful to behold, but a cli-

Sailing Vessels Loading with Grain. Salling vessels are going to compete with the big steamers in carrying wheat across the Atlantic. The Scottish Isles. an iron. fullrigged ship. is now loading with wheat for transportation to English ports. the has been chartered, it is said, by a number of large exporters in this city, who will send over in her about 72.000 bushels. The ship Garfield will also carry over a cargo of wheat.

New Land Scheme in New Jersey. ASBURY PARK, Doc. 21.—A land scheme has been started by Albert C. Twining, the cashier of the First National Bank of Arbury Park: Horace S. Fearmon of Philadelphia and Harry A. Yard of Belmar. They have organized an association with a cash capital of \$700,101 and called the spring Lake and Sea Girt Com-pany. They have purchased the property of the spring Lake Seach and rea Girt Land and Improvement Lom-panies and thus control both Wrock Fond and the large-lake at spring Lake Seach. Under their charter they can build hotels and cottarces and construct sewers, street car roads, and electric light and water works.

Steamboats.

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Largest and Finest Passenger Station in America, and the only one in the city of New York. On and After December \$1, 1889,

On and Alter Becember 3, 1809,
Trains will leave New York as follows:
18:00 A. M.—Syracuse and Montreal Express. Warner drawing-room care presented by Delaware
nor the State of State of State of State of State
of Troy via Flichburg Railroad transfer at Kast 4bany to drawing-room ear running through from
that point to St. Albana.
FAST MASE, AND STATE EXPRESS.

FANT MAIL AND STATE EXPRESS,

13:50 A. M.—Fer Albany, Behenschady, Utca

byracuse, Auburn, Geneva, Canandaigua, Reches

tar, Batavia and Buffalo, arriving rat Buffalo at 5:22

P. M. New Wagner Palace Drawing Room car to

Canandaigua daily except Sundays. Buffet Smoking

car New York to Buffale.

Canandalgua dally except Sundaya Buflet Smoking car New York to Buffale.

NEW YORK & CHICAGO LAMBITED.

***9466 A. M.—The famous Wagner Vestibule New York and thicage Limited, composed excusively of buflet smeking and library ear, dining car, straight id-seution and private compartment sleeping car, and fagwing room car for Syracuss, Rochester, Buffale, Eric Cieveland, Toledo, Bikhark, and Chicago, arriving at Chicago, at Bib. A. M. the next day.

THE MOUTH WESTERN LIMITED.

**1.0:50 A. M.—The magnificent new Southwestern Limited for Cincinnati. Indianapolia and St. Lous, consisting of a combination library, smoking and cafe car, a standard day coach, a gleeping car for St. Louia, a sleeping car for Cincinnati, a drawing-room car for Albany and a dining car. The entire rial is steam-heated, lighted by gas, and Wagner train is weather the wagner trains gas and wagner trains and the property of the complex of the c

New York to Troy.

THE WESTERN DAY EXPRESS.

11:50 A. M.—Day Express for Buffalo, Niagara
Falla, Toronto, Cleveland, Cincinnati Indianapota,
Detroit, and Chicago; Wagner drawing-room cars to
-yyacuse; Wagner eleoping car, Syracuse to Cleveland, Detroit, and Chicago. Farior car Cleveland
to Cincinnati, Wagner dining car New York to
Albany.

to Cincinnat. Wagner dining car New York to Albany.

8.30 P. M.—Albany. Troy, and Utica Special with Wagner drawing-room cars to Albany and Troy. Connects for Williamsiows. North Adams and Intermediate points on Fitching R. B. Wagner drawing-room car New York to Albany.

THE PAST WESTERN EXPRESS—
MOST POPULAR THROUGH

TEAIN IN AMERICA.

*:6:00 F. M.—Fast Chicago, Cincinnati and St. Louis
Express for Suffaio, Ningara Fails, Suspension Bridge,
Toronto, Cleveland, Cincinnati, Indianapolis, St.
Louis, Detroit, and Chicago, with through Wagner
vestibule sleeping and duling cars.

ADERONDACK MOUNTAINS AND MON-

ADREONDACK MOUNTAINS AND MON-TREAL.

*6:50 P. M.—Adirondack Mountain, Montreal, and
Lannadagus Express. Wagner sleeping cars desliy
to Flattshurch: also to Montreal, via Rouse's Foint
and via Ht. Abban, and to Syraouse and Canaudeigua delly, except Sundays.

2:00 P. M., Fast Mail Limited), arrives at Rochester
at 7:40 A. M., Buffale 9:35 A. M., and Cleveland 1:25
P. M.

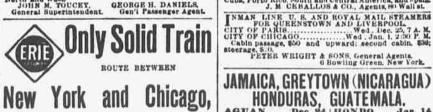
FAST NIGHT EXPRESS FOR THE

PAST NEGHT PAPERSS FOR THE WEST,

*10:00 P. M., Fast Night Express for Rochester, Buffalo, Niagers Valls, Toronto, Cleveland, Cincinnati, St. Louis, Detroit, and Choago, with through Warner Steeping Cara daily. Steeping Cara to Open Statutary, via Citica and Autorato Sundays only.

28:00 Midmight, for Saratogs and Adrondack Mountains. Warner Siesping Cara to Albany with trains for the North and West. There is no connection at Albany with trains for the North and West. There is no connection at Albany with the train leaving New York Saturday night. BERKSHIKE HILLS, VIA HARLEM DEVISION. 110:35 A. M., Pittsfeld and North Adams Express, with Wagner drawing room car through to Pitts-

110:35 A. M., Pittsfield and North Adams Express,
with Warner drawing-room car through to Pitts
field without change.
120 P. M., Essat Pittsfield and North Adams Special.
The entire train, including ejegant Wagner drawingroom cars runs through to Pittsfield without change.
Fast time. Superior service.
Tickets and space in drawing-room and sleeping cars
on sale at Grand Central station, Nos. 1 413, 756, and
1934 Broadway, 12 Park place, 69 West 125th st., and
1934 Broadway, 12 Park place, 69 West 125th st., and
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193



And the only line running its Dining Car Through to Chicago, 3:00 P. M., 6:00 P. M., 8:30 P. M. ALL SOLID EXPRESS TRAINS, AND EACH TRAIN

RUNS THROUGH TO CHICAGO WITHOUT CHANGE OF ANY CLASS OF CARS. W. J. MURPHY, L. P. FARMER, General Superintendent. General Passenger Agent.



BALTO, & OHIO R. R.

BALTO, & OHIO R. R.

PHILADELPHIA TO

BALTIMORE,

WASHINGTON,

CHICAGO, CINCINNATI,

ST. LOUIS,

And All Points West,

Leave NEW YORK, foot of Liberty at, as follows:
For CHICAGO, 3:20 F. M. 12:15 A. M.
For CINCINNATI, ST. LOUIS, 8:30 A. M., 5:00 F. M.
For WASHINGTON, BALTIMORE 8:39 A. M., 11:00 A.
M., 2:00 F. M., 3:20 F. M., 5:00 F. M., 12:15 A. M. All
trains daily except 11 A. M. Sunday,
For tickets and Pullman car space call at B. 2 C.
Ticket Omeos, 21, 261, 415, and 1,140 Breadway, or at
Station foot of Liberty at.
New York Transfer Company will call for and check
baggage from hotel or residence
J. T. Offeli.
Guil Manager.
Gen'l Manager.
Gen'l Passenger Agent.

CENTRAL RAILROAD OF NEW JERSEY. FOOT OF LIBERTY ST., NORTH RIVER, TIME TABLE OF NOVEMBER 10, 1880, SHORTEST AND QUICKEST SOUTE.

For Philadelphia, Baltimore, and Washington.

PRROFC, ARRE WESSBIRE COR.

BOUND BROOK ROUTE

Via Central R. R. of New Jercey Philadelphia and Reading R. R., and Bellimere and Ohio R. R.

For PHILADELPHIA at 4, 7145, 8:30, 11 A. M.; 1:30, 2, 3:20, 4, 5, 8, 7:30 P. M.; 12:15 night; Sundaya, 8:30, 9:30 A. M.; 2, 3:20, 5 P. M.; 12:16 night; For BALTIMORE and WASHINGTON daily at 8:30, (1), except Konday) A. M.; 2, 3:20, 5 P. M.; 12:15 night; Trains leaving at 7:45, 11 A. M., 1:30, 4, 5, 7:30 P. M.; 12:15 night, ave connection for Heading, Harrison; Pottavila, 26.

Tickets and parlor are seats can be procured at 71, 261, 410, 844, 1;40, 1;323 Broadway, 727 6th av. 264 West 135th at., 1304 East 125th at., New York Court at., 863 Fallors S. 168 Broadway, Brooklyn, New York Trainfer Company will call for and check baggage from hotel or residence.

NEW YORK NEW HAVEN AND HARTPORD R. R. Leave By wav of the By wave of the By w

NEW YORK, BUSQUEHANNA & WESTERN R R. LEAVE FOOT CORTLANDT AND DESEROSSES

Zailronas.

New York Central Pennsylvania RAILROAD.

THE STANDARD RAILWAY OF AMERICA! DOUBLE TRACK! STEEL RAILS!

STONE BALLAST AND STONE BRIDGES. PROTECTED BY THE INTERLOCKING SWITCH

AND BLOCK SIGNAL SYSTEM. The Scenic Line to the West

CELEBRATED PENNSYLVANIA LIMITED. The Ideal Railway Train of the Nineteenth Century.

AND THE ROUTE OF THE

TRAINS LEAVE STATIONS, foot of

Desbrosses and Corthudt sis, affording passengers a Grand View of the Harber, the Shipping, the Brooklyn Bridge, Gov-ernor's Island, and the Statue of Liberty, On and after NOVEMBER 10, 1889.

THE FAST LINE.

A. M.—The great morning train for all points in the West. Pullman Vestbuile Budut steeping tar NewYork to Richmont, Ind. Pullman Vestwine Buffer Faring Car New York to Pittsburch, Indiman Siesping Car Altoona to Chicago, and Pittsburch to Columbus they land, and Totedo. Train leaving New York on Saurday Siese not connect for things. Connects for Give land, daily, and for Williamsport, Lock Haven, and Tolede Satept Saturday.

THE PENNSYLVANIA LIMITED. 10 A. M., Composed exclusively of Paliman Vestibule. Drawing and State Room. Sleeping, Duling, Smeking and Observation tara containing indice and gentlemen a battrooma barier should brary and all the conveniences of a home. Heated by stationary and movable electric lignes. The pioneer of its class in the world. Through to Uncommand and Chicago every day.

ST. LOUIS, CHICAGO, AND CINCIN-

ST. LOUIS, CHICAGO, AND CINCINNATI EXPRESS,

9:00 P. M.—The fastest train between New York, Cincinnatt, and St. Louis. Philman Vestibule Sleeping Car New York to St. Louis. New York to Unicago. and Ceiumbus, and Dining Car New York to Alicona and Ceiumbus, and Dining Car New York to Alicona and Ceiumbus est. Louis. Through every day.

THE WESTERN EXPRESS.

6:30 P. M.—The popular evening train for all points in the West Northwest, and Southwest. Philman Vestibule Sleeping Car New York to St. Louis, New York to Unicanal, Rew York to St. Louis, New York to Cincinnatt, Rew York to St. Sonia, New York to Dining Car New York to Philadelphia. Through every day. Connects for Cleveland and Toledo daily, except Saturday. Paces Johnstown by daylight.

PACIFIC EXPRESS.

PACIFIC EXPRESS.

PACIFIC EXPRESS.

5:00 F. M., -The scenic train for the West crosses
the Alleghenies and runs through the Conemaugh Valley in the moraing. Fullman Vestibute Buffet Siesping Car New York to Chicago, New York to Membel
wis the Shenandoah Valley. Connects for Tolede
daily, and for Corry. Eric. the Oil Regions, Civerland,
and Columbus except Saturday.
For Lebanon 2:00 A. M., 3:00 F. M., and 12:15 night.
Yor Norristown, Phemixville, Pottstown, and Reading,
S:00, 11:00 A. M., 100, 2:10, and 4:30 F. M. Sundays,
G:10 and 10:00 A. M., and 2:00 F. M.

8:00, 11 to A. M., 100, 2 lb, and 4:30 F. M. Sundaya, 6:15 and 10:00 A. M., and 2:00 F. M.

BALTIMORE. WASHINGTON, AND THE ESOUTER.

"Washington Limited Express" of Fullman Parlor Caradaily, except Sunday, 10:10 A. M., arrive Washington 2:50 F. M.; and "Congressional Limited" daily, with Diaing Car at 3:20 F. M., arrive Washington 5:40 F. M.; requiar express, 4:15, 6:30, 8:03, and 8:30 A. 1:30, 2:10, 3:30, 4:31, and 9:00 F. M.; and 12:15 night, 10:00, 2:10, and 8:30 A. M.; 3:30, 4:31 and 9:00 F. M., and 12:15 night, For prints on Chesapeak and Ohio Railway and Cinclinati, Nisepers, Dining Car, and Coaches through, 3:30 F. M. daily.

For Atlantic City, 1:30 (Through Car) F. M. week daya. For Atlantic City, 1:30 (Through Car) F. M. week daya. For Caps March, Point Pleasant, and intermediate stations, via Rabway and Amboy, 2:10 A. M., 12:30 non. S:60 and 5:10 F. M. On Sunday, 2:40 A. M. and 0:00 F. M. (on out stop at Ashury Fark).

For Old Foint and Norfoik, via New York, Philadelphia A Norfoik Railroad, 9:00 A. M. daily except Sunday, and 9:00 F. M. daily; via Baltimore a Bay Line, 2:10 F. M. week daya.

Beats of "Brooklyn Annes" connect with all through trains at Jersey City, affording a speedy and direct transfer for Brooklyn travel.

FOR FUELLA DERLEBER.

Express Trains leave as follows:

Express Trains leave as follows:

4:10, 4:20, 7:20, 8:00, 8:30, 9:10 Chicage Limited, with Dining Car, and 10:10 Washington Limited, and 11:00 A. M., 12:20, 1:00, 2:10, 8:00, 1:30, 4:00, 4:30, 6:00,

COMPANIA TRANSATLANTICA ESPANOLA.

Repular line of mail steamships salling from company of the c

JAMAICA, GREYTOWN (NICARAGUA)

*Does not carry phasespers.

Nordeutscher LLOYD S. S. CO.
BHORT ROUTE TO LONDON AND CONTINENT.
PAST EXPRESS STEAMERS
Sall every WEDNEDDAY and SATURDAY
From pler fool of 2d sc., Hoodes.
OELRICHS A CO., 2 Bowling Green.

NEW YORK AND JAMAICA, W. L.—Every alternate for Thursday by steamship ATLANTA; fine passenger secommodations. JOHN E. KERRA CO., 41 Beaver st SAYANNAH PAST PREIGHT AND PASSENGER LINE S. Pour steamers weekly from New Pier 35, N. R., foot of Spring at E. Saturday, Dec. 21, at 3 P. M. SS. NACOU-HEE. Saturday, Dec. 22, at 3 P. M. SS. CITY OF BIRMINGHAM. Monday. Dec. 23, at 3 P. M. SS. CITY OF SAVANNAH. Friday. Dec. 27, at 3 P. M. SS. CITY OF SAVANNAH. Friday. Dec. 27, at 3 P. M. Connecting with Central Railway of Georgia and Savannah, Florida and Western Railway for all points in Georgia. Forida, count Carolina. Alabama, and Louisiana. Unsurpassed accommodations. First-class table dhote For Freight and passage apply to Georgia. Alabama and Louisiana. Unsurpassed accommodations. First-class table 4 Dec. 4 Por Freight and passage apply First. Gen. Ag. B. J. M. Hallatien, W. H. RHETT, Gen. Ag. East Agt. R. F. and W. By. Favannah Fast Lina, 517 Broadway.

B. L. WALKER, Agent Ocean Steamholp Co. New Fier 33, North River.

TROPICAL TOURS.

Novel and interesting trips on the steamers of the Atlas Steamering Co., occupying two weeks of longer embracing from two to thirty ports.

55 A DAY defrays all secensary explayed. Carthagens, Savanilla, Colon, Nicaragua, Costa Rica, and the Mosquito Coast Ports. Unit first Cabin Passengers carried. Address.

FIM. FORWOOD & CO., Agouts, 24 State st., New York. WHITE STAR LINE U. S. AND ROYAL MAIL STEAMERS, New York, Queenstown, and Liver

Steamboats.

A LL FARES REDUCED VIA STONINGTON LINE.

The inside route flosion SS. Steamers (HODE Island) and Marsachushits leave new Fier 36. K. one block above Canal st. at 4:30 F. M., Sundays & cented.

These flos large steamers are now running on the popular inside route to accommodate the travel by this well-known and enjoy able winter line.

A -PARES REDUCED to all points via Fall River A. line. Boston SS. Steamers FURITAN and PROVE DENUE leaves Pier 28. N. K. 1091 of Murray St. at 5:30 P. M. daily. Sundays included. Connection by Ansat Deat from Brooking and Jersey Utly at 4 F. M. at ORCHESTRA on each steamer. A -TROY BOATS -CITY OF TROY and BARATORA

A -trave Fier-sit N. E. (second pler above Christopher
at), daily, except Saturday, at 0 F. E. Electric linary
and bells to require Sunday steamer (outless at Allany).

CATSKILL EVENING LINE

Catskill and intermediate landings at 8 P. M.

Gatskill and intermediate landings at 8 P. M.

from foot of Jay st., North River

Norwich Line—Pavonite Inside Route—

Pares reduced to Boston, Sa, Worcester 22; coresponding reductions to all points hast intermers search

Far 40 to dismbers, North River, foot Waits at act

plar above historicases street Ferry), daily, Sunday as

Expiced 414 180 F. S.

cepted at 4 100 P M.
CHREWSBURY, LONG BRANCH, and intermediant of laudings—On and after to day, SEA BIBIL Capt in R. Parker, leaves New York foot Franklin et. Tuesday, Thursday, and Baturday at P. M. Leaves Bed Sea Monages, and Trains at R. M. Leaves Bed Sea Monages, and Trains at R. M. Leaves Bed Sea Monages, and Trains at R. M. Leaves Bed Sea Monages, and Trains at R. M. Leaves Bed Sea Monages, and Trains at R. M. Leaves Bed Sea Monages, and Trains at R. M. Leaves Bed Sea Monages, and Trains at R. M. Leaves Bed Sea Monages at R. M. Leaves Bed Sea Monages at Research and Trains at R. M. Leaves Bed Sea Monages at Research and Trains at R. M. Leaves Bed Sea Monages at R. M. M. Leaves Bed Sea Monages at R.